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10/574,899	04/06/2006	Nobuki Matsui	4633-0165PUS1	3397

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

RAHIM, AZIM

ART UNIT	PAPER NUMBER
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3744

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/574,899	Applicant(s) MATSUI ET AL.	
	Examiner AZIM RAHIM	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 3,5-20 and 22-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,21 and 26-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 21, 26 and 27 are ***again*** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 4 and 21, the limitation “the plurality of utilization side heat exchangers includes first and second adsorption heat exchangers” is unclear, in context, since it is not entirely clear as to the plurality of utilization side heat exchangers now includes first and second adsorption heat exchangers when an adsorption heat exchanger has already been claimed, and it is also unclear as to whether the previously claimed air heat exchanger has been excluded or included as a utilization side heat exchanger. For examination purposes, the aforementioned limitation will be interpreted as --the adsorption heat exchanger is a first adsorption heat exchanger, and the plurality of utilization side heat exchangers further includes a second adsorption side heat exchanger--. Furthermore, in claims 26 and 27, the “first adsorption heat exchangers” will be interpreted as being --adsorption heat exchangers--.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 2, 4, 21, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung (US 5,823,006) in view of Mathiprakasham (US 4,430,864).

Regarding claim 1, Jung teaches an air conditioning system (referring to figure 4) for running a refrigeration cycle by circulating refrigerant through a refrigerant circuit (see column 4, lines 18-25) provided with a heat-source side heat exchanger (41) and a plurality of utilization side heat exchangers (57 and 59) and supplying air having passed through the plurality of utilization side heat exchangers to a room (see column 6, lines 37-43) to cope with latent heat load and sensible heat load in the room (indoor fan 25 in combination with heat exchangers 57 and 59 are capable of performing this intended use function), wherein the plurality of utilization side heat exchangers include an air heat exchanger (57) for exchanging heat between air and refrigerant (the air heat exchanger 57 is capable of performing this intended use function); and wherein air passes through the air heat exchanger to cope with sensible heat load in the room (see column 4, lines 38-43; air heat exchanger 57 is capable of performing this intended use function). It is noted that the intended use functions identified above are merely statements of

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intended use and lends no additional structure to the claimed invention, and the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

However, Jung fail to teach that the plurality of utilization side heat exchangers includes at least one adsorption heat exchanger provided with an adsorbent on the surface thereof and that the refrigerant circuit alternately creates an adsorption action of allowing moisture in the air to adsorb on the at least one adsorption heat exchanger and a regeneration action of allowing moisture to desorb from the at least one adsorption heat exchanger, and the air conditioning system supplying air having passed through the adsorption heat exchanger to cope with latent heat load in the room.

Mathiprakasam teaches the well known concept of providing a heat exchanger (30) provided with an adsorbent (80) on the surface thereof (see column 5, lines 49-57); the refrigerant circuit alternately creates an adsorption action of allowing moisture in the air to adsorb on the heat exchanger [see column 6, lines 3-24] and a regeneration action of allowing moisture to desorb from the heat exchanger [see column 6, lines 24-31], and air passes through the heat exchanger (see column 5, lines 62-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the air conditioning system of Jung to include the use of an adsorption heat exchanger as taught by Mathiprakasam in order to effectively utilize the waste moisture due to the collection of moisture on an evaporator, thus increasing the versatility of the air conditioning system.

Regarding claim 2, Jung teaches that the refrigerant circuit is configured to operate in a mode in which the air heat exchanger serves as an evaporator and the heat-source side heat exchanger serves as a condenser (see column 6, line 53 - column 7, line 7) or a mode in which the air heat exchanger serves as a condenser and the heat source-side heat exchanger serves as an evaporator (see column 10, lines 29-57). It is noted that the intended use functions identified above are merely statements of intended use and lends no additional structure to the claimed invention, and the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

Regarding claim 4, Jung as modified by Mathiprakasam teach all the limitations as described above, but fail to teach that the plurality of utilization side heat exchangers includes a second adsorption heat exchangers and the refrigerant circuit is configured to repeatedly alternate between a mode in which the first adsorption heat exchanger serves as an evaporator and the second adsorption heat exchanger serves as a condenser and a mode in which the first adsorption heat exchanger serves as a condenser and the second adsorption heat exchanger serves as an evaporator, the refrigerant circuit dehumidifies air in the adsorption action by allowing moisture in the air to adsorb on the first or second adsorption heat exchanger serving as an evaporator and humidifies air in the regeneration action by allowing moisture to desorb from the first or second adsorption heat exchanger serving as a condenser, and the air conditioning system supplies the

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air dehumidified or humidified by the first or second adsorption heat exchanger to the room to cope with latent heat load in the room.

Mathiprakasam teaches the use of a throttling expansion valve (20) in series with first and second heat exchangers (illustrated in figure 1 and see column 5, lines 32-34). Mathiprakasam further teaches the use of a second adsorption heat exchanger (40) along with the adsorption heat exchanger (30) for the purpose of dehumidification by allowing air to absorb on the adsorption heat exchanger (see column 6, lines 3-31) and humidification that functions the opposite (see column 6, lines 60-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the air conditioning system of Jung to include the second adsorption heat exchanger as taught by Mathiprakasam in order to provide added versatility to the system by providing the function of humidification along with the function of dehumidification.

Regarding claim 21, Jung as modified by Mathiprakasam teach all the limitations as described above, and Jung further teaches that the refrigerant circuit comprises a first circuit in which the heat-source side heat exchanger a capillary tube (49) and the air heat exchanger are arranged in series (illustrated in figure 4).

However, Jung fails to explicitly teach a first variable-opening expansion valve, a second adsorption heat exchanger, and wherein a second circuit in which the adsorption heat exchanger a second variable- opening expansion valve and the second adsorption heat exchanger are arranged in series, the first and second circuits being connected in parallel with each other.

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Mathiprakasam teaches the use of a throttling expansion valve (20) in series with first and second heat exchangers (illustrated in figure 1 and see column 5, lines 32-34). Mathiprakasam further teaches the use of a second adsorption heat exchanger (40) along with the adsorption heat exchanger (30) for the purpose of dehumidification (see column 6, lines 3-31) and humidification (see column 6, lines 60-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the capillary tube of Jung with the throttling expansion valve as taught by Mathiprakasam in order to advantageously control the superheat of the refrigerant, thus preventing damage to the compressor.

Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the air conditioning system of Jung to include the second adsorption heat exchanger as taught by Mathiprakasam in order to provide added versatility to the system by providing the function of humidification along with the function of dehumidification.

Furthermore, the general concept of providing two refrigerant circuits disposed in parallel revolving around one compressor falls within the realm of common knowledge as obvious mechanical expedient and is illustrated by Jung which teaches a first refrigerant circuit (condenser 41, capillary tube 49, evaporator 57 along with conduits 37, 45, 53 and 61) and a second refrigerant circuit (condenser 43, capillary tube 51, evaporator 59 along with conduits 39, 47, 55 and 63) both being disposed in parallel to each other (illustrated in figure 3), and one having ordinary skill in the art would have been motivated to include the use of two refrigerant circuits disposed in parallel, one circuit including adsorption heat exchangers in order to provide

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added versatility to the system by providing the function of humidification along with the function of dehumidification.

Regarding claims 26 and 27, Jung teaches a first four-way selector valve (35) and a second four-way selector valve (65) for changing a flow passage of refrigerant to switch between a state in which the air heat exchanger (57) serves as an evaporator and the heat-source side heat exchanger (41) serves as a condenser (see column 6, line 53 - column 7, line 38) and a state in which the air heat exchanger serves as a condenser and the heat-source side heat exchanger serves as an evaporator is connected to the first circuit (see column 7, line 38 - column 8, line 26); and for changing a flow passage of refrigerant to switch between a state in which a second air heat exchanger (59) serves as an evaporator and a second heat-source side heat exchanger (43) serves as a condenser (see column 6, line 53 - column 7, line 38) and a state in which the second air heat exchanger serves as a condenser and the second heat-source side heat exchanger serves as an evaporator is connected to the second circuit (see column 7, line 38 - column 8, line 26).

Jung fails to teach that one of the circuits comprises first and second adsorption heat exchangers.

As stated above, Mathiprakasam teaches the use of a second adsorption heat exchanger (40) along with the adsorption heat exchanger (30) for the purpose of dehumidification (see column 6, lines 3-31) and humidification (see column 6, lines 60-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the air conditioning system of Jung to include the second

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adsorption heat exchanger as taught by Mathiprakasam in order to provide added versatility to the system by providing the function of humidification along with the function of dehumidification.

Allowable Subject Matter

6. Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed 10/2/2009 have been fully considered but they are not persuasive. In response to the applicant's arguments that the 35 U.S.C. 112, second paragraph rejection was improper (see page 14 of the applicant's remarks section), the rejection will remain, since it is unclear as to how the plurality of utilization side heat exchangers now in claims 4 and 21 includes first and second adsorption heat exchangers when an adsorption heat exchanger has already been claimed in claim 1, and it is also unclear as to whether the claimed air heat exchanger in claim 1 has been excluded or included as a utilization side heat exchanger in claims 4 and 21. Therefore, the 35 U.S.C. 112, second paragraph rejection is properly upheld. Also, the applicant argues that neither Jung or Mathiprakasam do not disclose or suggest the limitation "the air conditioning system supplies air having passed through the at least one adsorption heat exchanger to the room to cope with latent heat in the room and supplies the air having passed through the air heat exchanger to the room to cope with sensible heat load in the

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room” as recited in claims 1, 2, 4, 21, 26 and 27 (see applicant’s remarks section on pages 15 and 16). The Examiner respectfully disagrees. As disclosed in column 4, lines 38-43 of Jung, air heat exchanger 57 is capable of performing this intended use limitation “to cope with sensible heat load in the room,” which lends no patentable weight to the claimed invention. Also, as disclosed in column 5, lines 62-64 of Mathiprakasam, heat exchanger 30 with adsorbent 80 is capable of performing the intended use limitation “to cope with latent heat in the room,” which lends no patentable weight to the claimed invention. In addition, in order to be given patentable weight, a functional recitation must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. In re Fuller, 1929 C.D. 172; 388 O.G. 279. In conclusion, for at least these reasons, the Examiner respectfully submits that the rejections of claims 1, 2, 4, 21, 26 and 27 are properly upheld.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mudford (US 4,938,032), Ashley et al. (US 4,930,322) and Hojo et al. (US 5,277,034).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./
Examiner, Art Unit 3744
12/28/2009

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744